CLAIMS

The invention is claimed as follows:

1. A method of fabricating a semiconductor light emitting device, comprising the steps of:

growing a first semiconductor layer of a first conductive type on a substrate;

forming a growth mask having an opening at a specific position on the first semiconductor layer;

selectively growing a second semiconductor layer of the first conductive type on a portion, exposed from the opening of the growth mask, of the first semiconductor layer;

removing the growth mask; and

sequentially growing at least an active layer and a third semiconductor layer of a second conductive type so as to cover the second semiconductor layer.

2. The method of fabricating a semiconductor light emitting device according to claim 1, wherein the growth mask comprises a film selected from a group consisting of a silicon oxide film, a silicon nitride film, a silicon oxynitride film, and a stacked film including two or more of the silicon oxide film, silicon nitride film, and silicon oxynitride film.

3. The method of fabricating a semiconductor light emitting device according to claim 1, wherein the second semiconductor layer comprises a crystal layer having tilt crystal planes tilted from a principal plane of the substrate.

4. The method of fabricating a semiconductor light emitting device according to claim 3, wherein the crystal layer has a wurtzite type crystal structure.

5. The method of fabricating a semiconductor light emitting device according to claim 3, wherein the crystal layer includes a nitride oxide based III-V compound semiconductor.

6. The method of fabricating a semiconductor light emitting device according to claim 1, wherein each of the first semiconductor layer, the second semiconductor layer, the active layer, and the third semiconductor layer includes a nitride oxide based III-V compound semiconductor.

7. The method of fabricating a semiconductor light emitting device according to claim 4, wherein the tilt crystal planes include S-planes.

8. The method of fabricating a semiconductor light emitting device according to claim 7, wherein at least 90% or more of a thickness of a growth layer including the active layer and the third semiconductor layer is grown at a growth rate of about 10 μm/h or more.

9. The method of fabricating a semiconductor light emitting device according to claim 4, wherein the crystal layer is formed into a hexagonal pyramid shape having S-planes as the tilt crystal planes.

10. The method of fabricating a semiconductor light emitting device according to claim 9, further comprising the step of forming an electrode of the second conductive type side mainly on the S-planes of the third semiconductor layer on the second semiconductor layer.

11. The method of fabricating a semiconductor light emitting device according to claim 4, wherein the crystal layer is formed into a hexagonal truncated pyramid shape having S-planes as the tilt crystal planes and a C-plane as an upper plane.

12. The method of fabricating a semiconductor light emitting device according to claim 11, further comprising the step of forming an electrode of the second conductive type side on the C-plane of the third semiconductor layer on the second semiconductor layer.

13. The method of fabricating a semiconductor light emitting device according to claim 1, wherein the principal plane of the substrate comprises a C-plane.

14. The method of fabricating a semiconductor light emitting device according to claim 1, wherein the second semiconductor layer is selectively grown in such a manner as to be spread in the lateral direction from the opening of the growth mask.

15. The method of fabricating a semiconductor light emitting device according to claim 1, wherein a fourth semiconductor layer of the first conductive type is grown on the second semiconductor layer after removal of the growth mask and before growth of the active layer.

16. A semiconductor light emitting device comprising:

a semiconductor layer of a first conductive type formed on a principal plane of a substrate, the semiconductor layer including a raised crystal portion having tilt crystal planes tilted from the principal plane;

at least an active layer and a semiconductor layer of a second conductive type wherein, the active layer and the semiconductor layer are sequentially stacked at least on the tilt crystal planes of the raised crystal portion, and

a first electrode electrically connected to the semiconductor layer of the first conductive type; and

a second electrode electrically connected to the semiconductor layer of the second conductive type wherein, the second electrode are provided on the semiconductor layer of the second conductive type on the raised crystal portion; and

wherein a size of the second electrode is in a range of about 50% or less of a size of the raised crystal portion on which the active layer and the semiconductor layer of the second conductive type have been stacked.

17. The semiconductor light emitting device according to claim 16, wherein the raised crystal portion has a wurtzite type crystal structure.

18. The semiconductor light emitting device according to claim 16, wherein the raised crystal includes a nitride oxide based III-V compound semiconductor.

19. The semiconductor light emitting device according to claim 16, wherein each of the semiconductor layer of the first conductive type, the active layer, and the semiconductor layer of the second conductive type includes a nitride oxide based III-V compound semiconductor.

20. The semiconductor light emitting device according to claim 16, wherein the tilt crystal planes includes S-planes.

21. The semiconductor light emitting device according to claim 16, wherein the raised crystal portion is formed into a hexagonal pyramid shape having S-planes as the tilt crystal planes.

22. The semiconductor light emitting device according to claim 16, wherein the raised crystal portion is formed into a hexagonal truncated pyramid shape having S-planes as the tilt crystal planes and a C-plane as an upper plane.

23. A method of fabricating an integral type semiconductor light emitting unit, the method comprising the steps of:

growing a first semiconductor layer of a first conductive type on a substrate;

forming a growth mask having an opening at a position on the first semiconductor layer;

selectively growing a second semiconductor layer of the first conductive type on a portion, exposed from the opening of the growth mask, of the first semiconductor layer;

removing the growth mask; and

sequentially growing at least an active layer and a third semiconductor layer of a second conductive type so as to cover the second semiconductor layer.

24. An integral type light emitting unit including a stack of a plurality of light emitting devices, each of the light emitting devices comprising:

a semiconductor layer of a first conductive type formed on a principal plane of a substrate, wherein the semiconductor layer includes a raised crystal portion having tilt crystal planes tilted from the principal plane;

at least an active layer and a semiconductor layer of a second conductive type, wherein the active layer and the semiconductor layer are sequentially stacked at least on the tilt crystal planes of the raised crystal portion;

a first electrode electrically connected to the semiconductor layer of the first conductive type; and

a second electrode electrically connected to the semiconductor layer of the second conductive type, wherein the second electrode are provided on the semiconductor layer of the second conductive type on the raised crystal portion, and

wherein a size of the second electrode is in a range of about 50% or less of a size of the raised crystal portion on which the active layer and the semiconductor layer of the second conductive type have been stacked.

25. A method of fabricating an image display unit, comprising the steps of:

growing a first semiconductor layer of a first conductive type on a substrate;

forming a growth mask having an opening at a specific position on the first semiconductor layer;

selectively growing a second semiconductor layer of the first conductive type on a portion, exposed from the opening of the growth mask, of the first semiconductor layer;

removing the growth mask; and

sequentially growing at least an active layer and a third semiconductor layer of a second conductive type so as to cover the second semiconductor layer.

26. An image display unit comprising:

a semiconductor layer of a first conductive type formed on one principal plane of a substrate, wherein the semiconductor layer includes a raised crystal portion having tilt crystal planes tilted from the principal plane;

at least an active layer and a semiconductor layer of a second conductive type, wherein the active layer and the semiconductor layer are sequentially stacked at least on the tilt crystal planes of the raised crystal portion;

a first electrode electrically connected to the semiconductor layer of the first conductive type; and

a second electrode electrically connected to the semiconductor layer of the second conductive type, wherein the second electrode being provided on the semiconductor layer of the second conductive type on the raised crystal portion, and

wherein a size of the second electrode is in a range of about 50% or less of a size of the raised crystal portion on which the active layer and the semiconductor layer of the second conductive type have been stacked.

27. A method of fabricating an illuminating unit, comprising the steps of:

growing a first semiconductor layer of a first conductive type on a substrate;

forming a growth mask having an opening at a specific position on the first semiconductor layer;

selectively growing a second semiconductor layer of the first conductive type on a portion, exposed from the opening of the growth mask, of the first semiconductor layer;

removing the growth mask; and

sequentially growing at least an active layer and a third semiconductor layer of a second conductive type so as to cover the second semiconductor layer.

28. An illuminating unit comprising:

a semiconductor layer of a first conductive type formed on a principal plane of a substrate, wherein the semiconductor layer includes a raised crystal portion having tilt crystal planes tilted from the principal plane;

at least an active layer and a semiconductor layer of a second conductive type, wherein the active layer and the semiconductor layer same sequentially stacked at least on the tilt crystal planes of the raised crystal portion;

a first electrode electrically connected to the semiconductor layer of the first conductive type; and

a second electrode electrically connected to the semiconductor layer of the second conductive type, wherein the second electrode is provided on the semiconductor layer of the second conductive type on the raised crystal portion, and

wherein a size of the second electrode is in a range of about 50% or less of a size of the raised crystal portion on which the active layer and the semiconductor layer of the second conductive type have been stacked.